

Claims

- [c1] 1.A capacitive semiconductor pressure sensor comprising:
- a non-single-crystal-silicon-based substrate;
 - a conductive movable polysilicon diaphragm;
 - a polysilicon supporter positioned on the non-single-crystal-silicon-based substrate for fixing two ends of the polysilicon diaphragm and forming a sealed cavity between the polysilicon diaphragm and the non-single-crystal-silicon-based substrate;
 - a stationary electrode positioned on the non-single-crystal-silicon-based substrate and below the polysilicon diaphragm, the stationary electrode and the polysilicon diaphragm constituting a plate capacitor; and
 - a thin film transistor (TFT) control circuit positioned on the non-single-crystal-silicon-based substrate and electrically connected to the plate capacitor.
- [c2] 2.The capacitive semiconductor pressure sensor of claim 1 wherein the non-single-crystal-silicon-based substrate is a glass substrate.
- [c3] 3.The capacitive semiconductor pressure sensor of claim 2 wherein the TFT control circuit is a low temperature

polysilicon TFT control circuit.

[c4] 4.The capacitive semiconductor pressure sensor of claim 1 wherein the non-single-crystal-silicon-based substrate is a quartz substrate.

[c5] 5.The capacitive semiconductor pressure sensor of claim 4 wherein the TFT control circuit is a high temperature polysilicon TFT control circuit.

[c6] 6.The capacitive semiconductor pressure sensor of claim 1 wherein the stationary electrode comprises aluminum (Al), titanium (Ti), platinum (Pt), or alloys.

[c7] 7.The capacitive semiconductor pressure sensor of claim 1 wherein the polysilicon diaphragm and the polysilicon supporter are formed simultaneously.

[c8] 8.The capacitive semiconductor pressure sensor of claim 1 wherein the polysilicon diaphragm is a doped polysilicon diaphragm.

[c9] 9.The capacitive semiconductor pressure sensor of claim 1 wherein the non-single-crystal-silicon-based substrate further comprises a thin film transistor display region for displaying a variation of pressure detected by the capacitive semiconductor pressure sensor.

[c10] 10.A capacitive semiconductor pressure sensor compris-

ing:

an insulating substrate;

a conductive movable diaphragm;

a supporter positioned on the insulating substrate for fixing two ends of the diaphragm and forming a sealed cavity between the diaphragm and the insulating substrate;

a stationary electrode positioned on the insulating substrate and below the diaphragm; and

a control circuit electrically connected to the diaphragm and the stationary electrode.

[c11] 11.The capacitive semiconductor pressure sensor of claim 10 wherein the stationary electrode comprises aluminum (Al), titanium (Ti), platinum (Pt), or alloys.

[c12] 12.The capacitive semiconductor pressure sensor of claim 10 wherein the diaphragm and the supporter are formed simultaneously.

[c13] 13.The capacitive semiconductor pressure sensor of claim 12 wherein the supporter comprises polysilicon.

[c14] 14.The capacitive semiconductor pressure sensor of claim 13 wherein the diaphragm comprises a doped polysilicon.

[c15] 15.The capacitive semiconductor pressure sensor of

claim 10 wherein the diaphragm comprises a conductive material.

[c16] 16.The capacitive semiconductor pressure sensor of claim 10 wherein the insulating substrate is a glass substrate.

[c17] 17.The capacitive semiconductor pressure sensor of claim 16 wherein the control circuit is positioned on the glass substrate and the control circuit comprises a low temperature polysilicon thin film transistor control circuit.

[c18] 18.The capacitive semiconductor pressure sensor of claim 10 wherein the insulating substrate is a quartz substrate.

[c19] 19.The capacitive semiconductor pressure sensor of claim 18 wherein the control circuit is positioned on the quartz substrate and the control circuit comprises a high temperature polysilicon thin film transistor control circuit.

[c20] 20.The capacitive semiconductor pressure sensor of claim 10 wherein the control circuit is positioned on a printed circuit board (PCB) and is electrically connected to the stationary electrode and the diaphragm via a flexible printed circuit (FPC) board.

- [c21] 21. The capacitive semiconductor pressure sensor of claim 10 wherein the control circuit is positioned on a flexible printed circuit (FPC) board, the control circuit being electrically connected to the stationary electrode and the diaphragm via the flexible printed circuit board.
- [c22] 22. The capacitive semiconductor pressure sensor of claim 10 wherein the insulating substrate further comprises a thin film transistor display region for displaying a variation of pressure detected by the capacitive semiconductor pressure sensor.